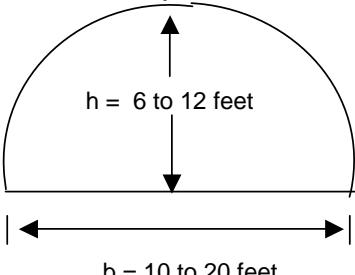
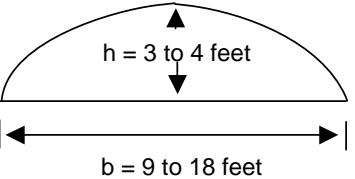
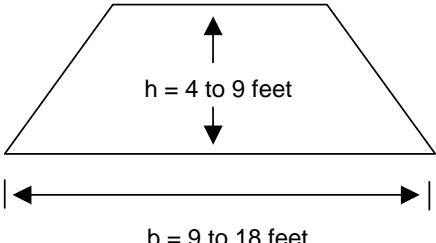
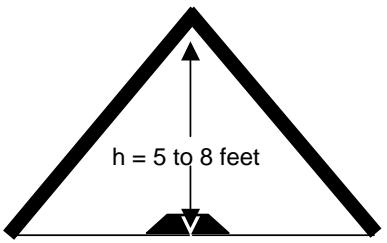
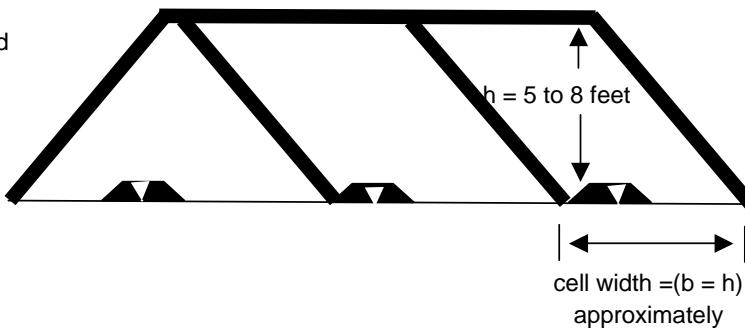


Estimating the Amount of Material On-Site

California Integrated Waste Management Board

The amount of material on site and estimation pile size is a challenge. Pile configuration may be specified as part of the odor impact minimization plan, permit condition or plan of operation. Additionally, indicators of pile size may be required, such as poles around the site where pile height may not exceed. Below are some useful formulas for estimating the amount of material on-site.

TABLE 4.2: Typical windrow and pile and cross-sectional areas(See Table 4.3 for data)

Method and equipment used	Approximate shape	Cross-sectional area
Windrows/piles turned with a bucket loader		$A = \frac{2}{3} \times b \times h$
Small tractor-drawn windrow turners or any turners with wet materials		$A = \frac{2}{3} \times b \times h$
Self-propelled and tractor drawn windrow turners		$A = h \times (b-h) *$
Individual aerated static piles and other piles with little or no turning		$A = \frac{1}{2} \times b \times h$
Extended aerated static piles		Cell area $A = b \times h$

* This formula is an approximation and is valid only when the width is greater or equal to twice the height

TABLE 4.3: Approximate cross-sectional area of windrows/piles

High parabolic windrows/piles -- turned with bucket loader *

Area (square feet)

Width (feet)	Height (feet)						
	6	7	8	9	10	11	12
10	40	47	53	60	67	73	80
12	48	56	64	72	80	88	96
14	56	65	75	84	93	103	112
16	64	75	85	96	107	117	128
18	72	84	96	108	120	132	144
20	80	93	107	120	133	147	160

* Area = 2/3 width x height

Triangular-shaped static piles ^b

Width (feet)	Area (square feet)					
	Height (feet)					
5	6	7	8	9	10	
10	25	30	35	40	45	50
12	30	36	42	48	54	60
14	35	42	49	56	63	70
16	40	48	56	64	72	80
18	45	54	63	72	81	90

^b Area = 1/2 width x height**Cells -- extended static piles ^c**

Width (feet)	Area (square feet)					
	Height (feet)					
5	6	7	8	9	10	
10	25	30	35	40	45	50
12	30	36	42	48	54	60
14	35	42	49	56	63	70
16	40	48	56	64	72	80
18	45	54	63	72	81	90

^c Area = 1/2 width x heightTrapezoidal shape -- most windrow turners ^d

Area (square feet)

Width (feet)	Height (feet)					
	4	5	6	7	8	9
10	24	25	-	-	-	-
11	28	30	-	-	-	-
12	32	35	36	-	-	-
13	36	40	42	-	-	-
14	40	45	48	49	-	-
15	44	50	54	56	-	-
16	48	55	60	63	64	-
17	52	60	66	70	72	-
18	56	65	72	77	80	81
19	60	70	78	84	88	90
20	64	75	84	91	96	99

Low Parabolic windrows - passively aerated windrows,
small windrow turners, or wet materials *

Width (feet)	Area (square feet)				
	Height (feet)				
3	3.5	4	4.5	5	
9	18	21	24	27	30
10	20	23	27	30	33
11	22	26	29	33	37
12	24	28	32	36	40
13	26	30	35	39	43
14	28	33	37	42	47

* Formula: Area = 2/3 width x height

Note: Shapes are illustrated in Table 4.2. Cross-sectional areas in this Table are intended for use in calculating the volume of raw materials in a windrow or pile. The cover and base are not accounted for. If a base or insulating cover is used, consider it when estimating the space required for the pile.

References

Rynk, R.: *On-Farm Composting Handbook*, Northeast Regional Agricultural Engineering Service, Ithaca, N.Y., 1992.